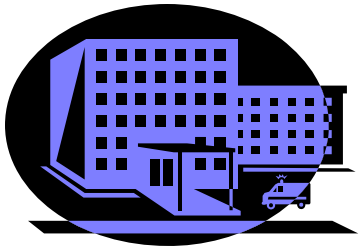
Pollution Prevention for Sustainable Healthcare



Environmental Compliance Assistance Workshop

for Mississippi Hospitals & Healthcare Facilities

July 30, 2008

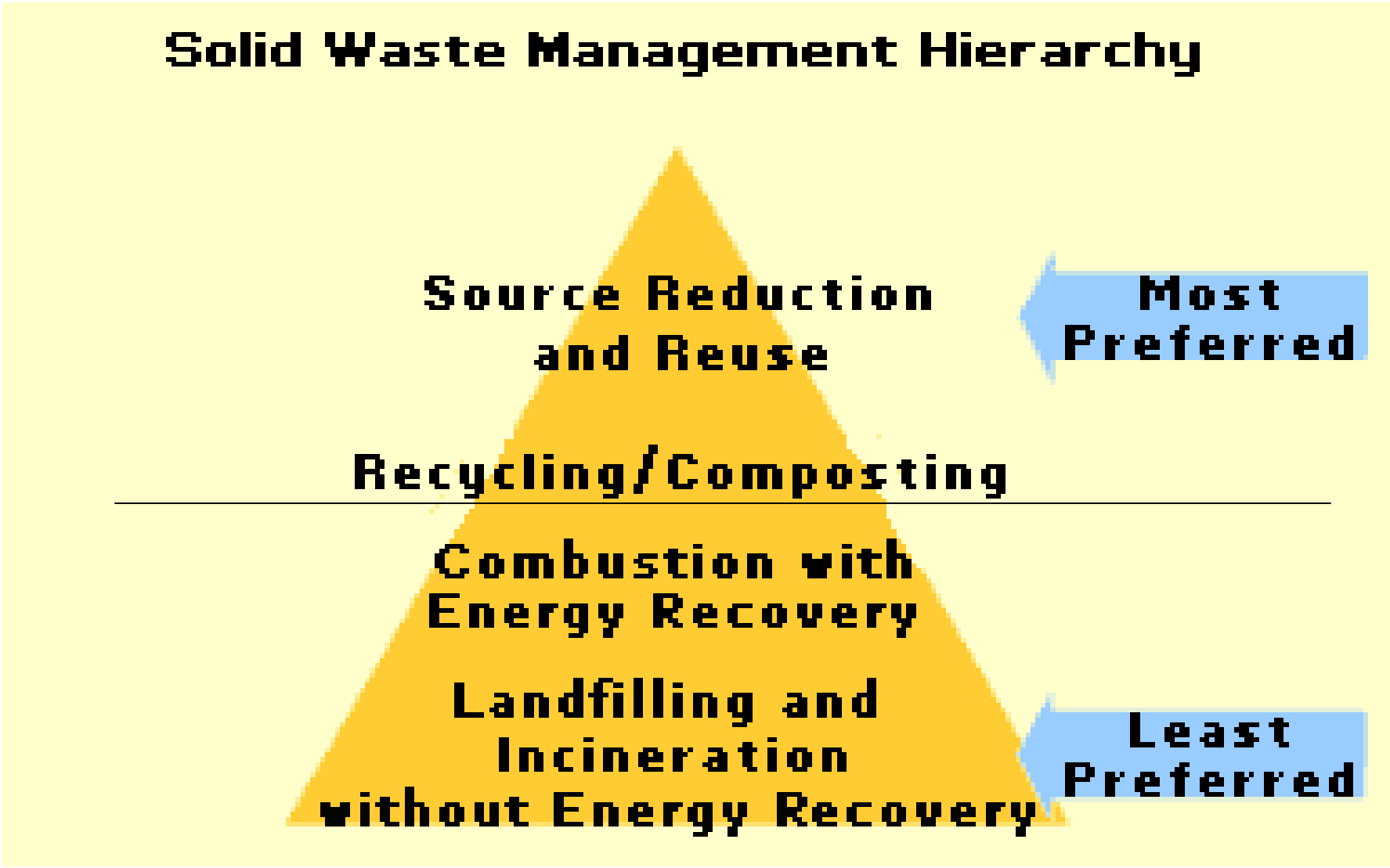
EPA says…

"Pollution Prevention is any practice that reduces the amount of any hazardous substance, pollutant, or contaminant entering any waste stream or released into the environment prior to recycling, treatment or disposal."

Pollution Prevention

- Saves Materials
- Saves Energy
- Saves Time
- Reduces Expenses

Solid Waste Management Hierarchy



Pollution Prevention Opportunities

- Environmentally preferable purchasing
- Inventory control improvement
- Raw material substitution
- Process or Procedure modification
- Energy efficiency improvement
- Training
- Maintenance/Housekeeping Practices

Environmentally Preferable Purchasing (EPP)

"products or services that have a lesser or reduced effect on human health and the environment when compared with competing products or services that serve the same purpose"

Environmentally Preferable Purchasing/Inventory Control - Hospitals

- Use simple alcohols and ketones in place of petroleum hydrocarbons such as toluene and xylene
- Substitute terpene based solvents or naptha isoparaffinic hydrocarbons for xylenes used for slide cleaning
- Incorporate environmental language in your requests for proposals (RFPs) and purchasing contracts

Environmentally Preferable Purchasing/Inventory Control - Hospitals

- Purchase in totes or recyclable containers
- Ensure distribution throughout the facility through one person
- Develop plans for leftover chemicals with disposal as last resort

Raw Material Substitution

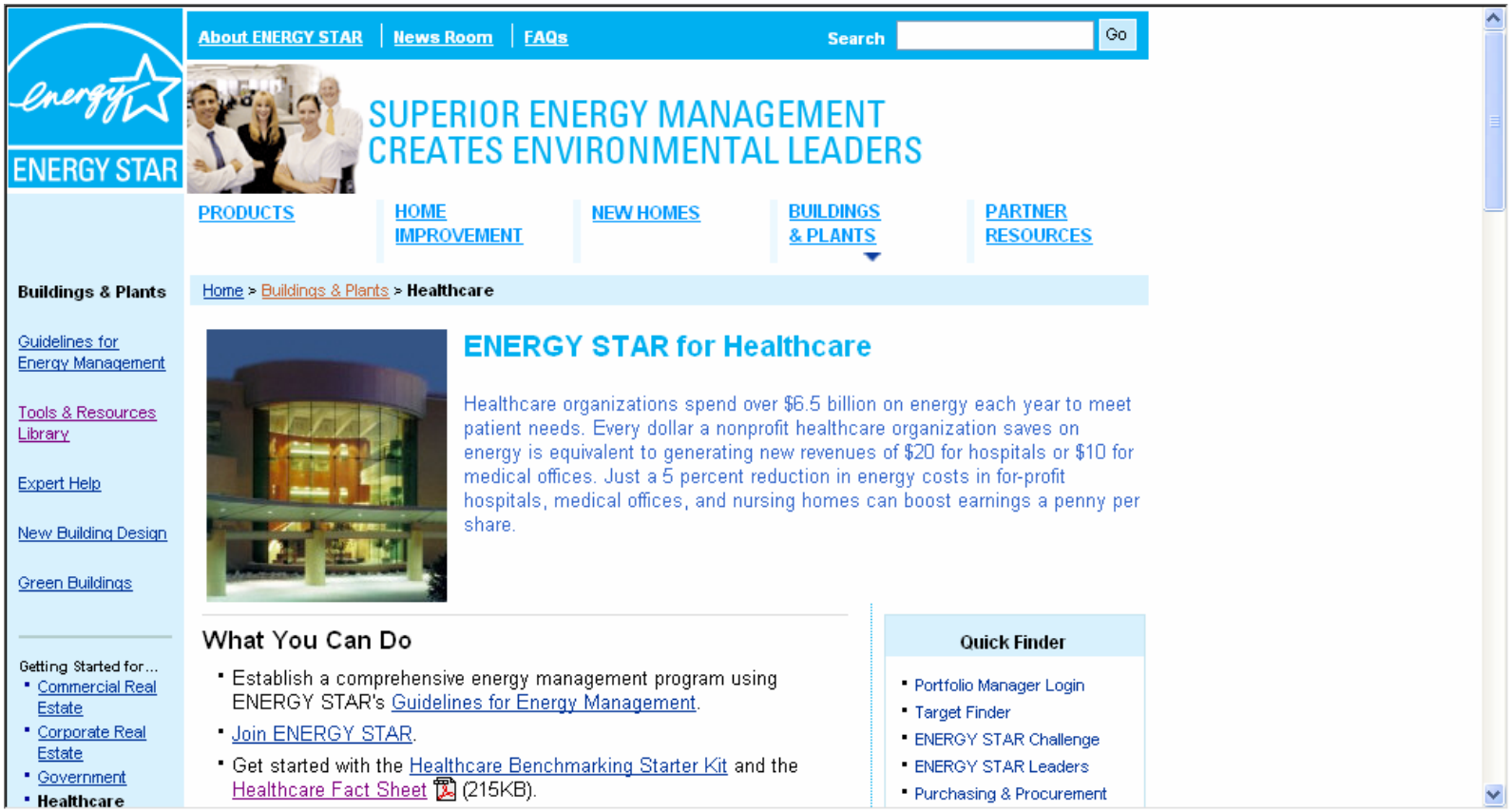
- Substitutes for formalin
  - Bleach, peracetic acid or other disinfectants might be used for dialysis machines/dialyzers
- Evaluate specialty detergents, potassium hydroxide, or sonic baths to replace chromic and sulfuric acid for cleaning glassware
- Mercury-free products
- HK- use phenolic disinfectant alternatives

Process or Procedure Modification

- Do not mix waste unnecessarily
- Evaluate sonic or steam cleaning instead of chemical sterilization
- Evaluate routine lab processes to determine if quantities of reagents are reducible
  - Calibrated solvent dispensers
  - Reduced reagent volumes

Energy Efficiency Improvement

Energy Star for Healthcare



Energy Star for Healthcare

"Rating Energy Performance with EPA's Portfolio Manager for Healthcare Facilities"

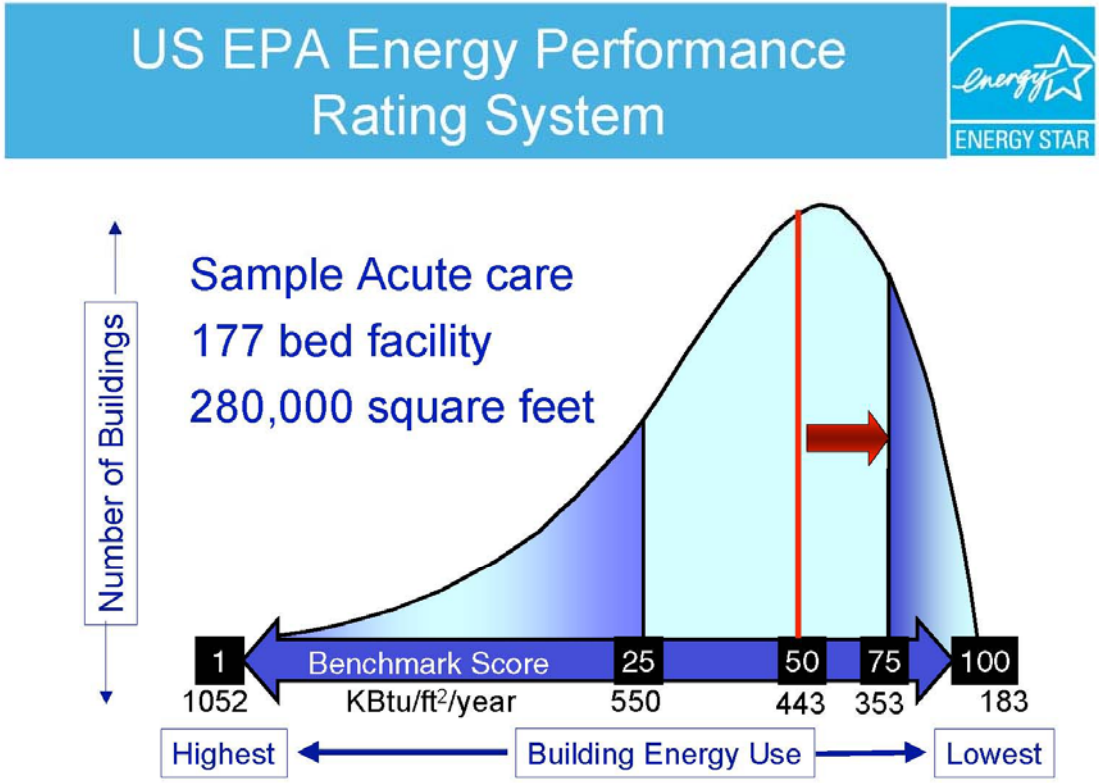
Thursday, August 14

1:00 – 2:30

http://www.energystar.gov

- ***Tools and Resources Library***
- ***Getting Started for Healthcare***

Benchmarking Energy Usage



Service Providers Offer Automated Benchmarking

Service Provider	Number of Facilities
Advantage IQ	29,550
LPB Energy Consulting	925
UtilityAccounts.com	805
Cadence Network	315
New Energy Technology	215
Johnson Controls	125
EnergySolve	125

Ref: EPA EnergyStar as of 2/3/08

Training

- Waste Segregation

  Studies have shown typically 30-50% of what is disposed as Regulated Medical Waste could have been managed as Solid Waste

- Visual Reinforcement

  Posters, Placards, Signage

Recycling Opportunities

- Distilling of xylene, formalin
- Using reusable sharps container
- Reprocessing Medical devices
- Solid Waste – paper, plastic
- Fluorescent lights
- Batteries

Xylene, Formalin recovery

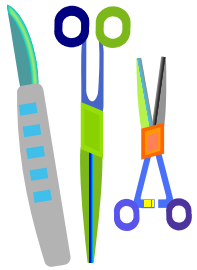
- Xylene recovery is common. Formalin recovery is becoming more common in health care facilities. Recycling formalin is economical when using about 5 gallons a week, factoring in neutralizer and waste disposal costs.
- Non-technical staff can safely operate distillation and filtration equipment, which require little operator time. Transfers or chemistry adjustments should take place under a hood with carbon filters to prevent vapors from dispersing.

Reusable Sharps Container

- Most Service Providers calculate container requirements
- Containers are emptied mechanically – lessening potential for needlesticks (one survey 10—30% less)
- Per FDA, typical containers can be reused up to 500 times with proper disinfection

Reprocess “Single Use” Medical Devices

- ❖ Previously utilized devices
- ❖ Opened and unused devices
- ❖ Unopened devices whose expiration date has passed



- Arthroscopic shavers
- Scissors and staplers
- Biopsy forceps
- Clamps and dissectors
- Orthopedic drill bits and burrs
- Soft tissue ablators
- and more……..

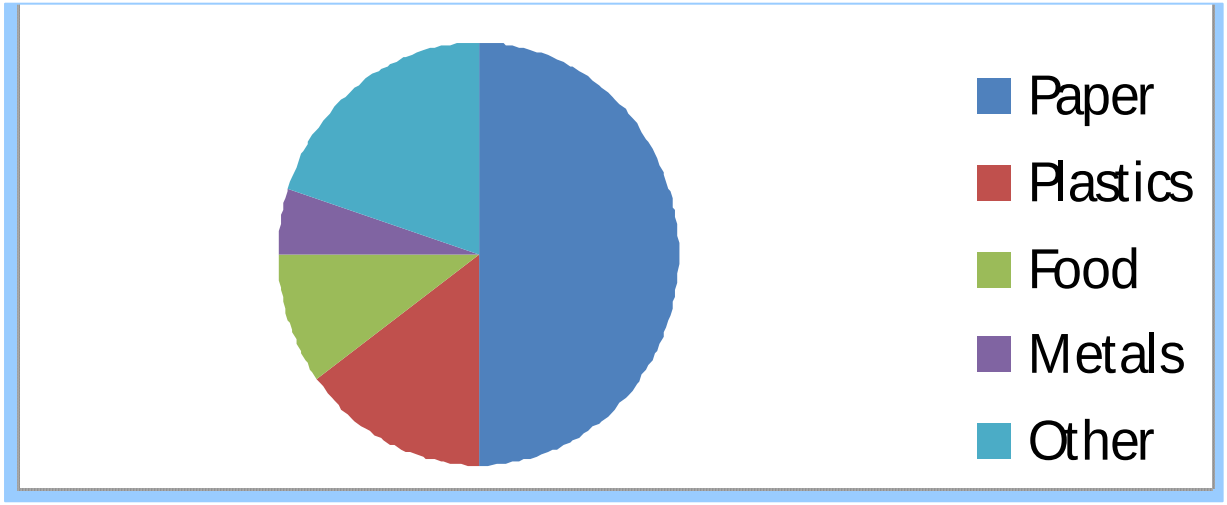
More information on reprocessing:

The Association of Medical Device Reprocessors

www.amdr.org

Hospital Solid Wastes

Solid Waste – 16 lbs/day/patient



Paper & Plastic!!

Cardboard Recycling

Number of Beds	Estimated Cardboard Generation (tons/month)
0-50	2
50-100	2-4
100-200	4-8
200-300	8-12
300-400	12-16
400-500	16-20

300 bed hospital 144 tons per year x $85/ton = $12,240 revenue
144 tons per year x $45/ton = $ 6,480
TOTAL = $18,720

Fluorescent Lamps

The two most common types of energy-efficient lighting that contain mercury are:

- fluorescent bulbs, including compact fluorescent light bulbs (CFLs) and
- high intensity discharge (HID) bulbs
  - mercury vapor bulbs, metal halide and high-pressure sodium bulbs

Batteries

- Lead Acid
- Nickel-Cadmium
  - Alarm systems, pagers, backup power sources in medical monitors and equipment
- Mercuric oxide
  - Hearing aids, smoke detectors, Monitors (oxygen, fetal, portable EKG)
- Lithium
- Silver cadmium
  - Medical electronics
- Zinc-air
  - Hearing aids, electronic pagers

Resources

EPA http://www.epa.gov

SECTOR Info

- Fact Sheets
- Posters
- Case Studies
- Guidance Documents

TOPIC Info

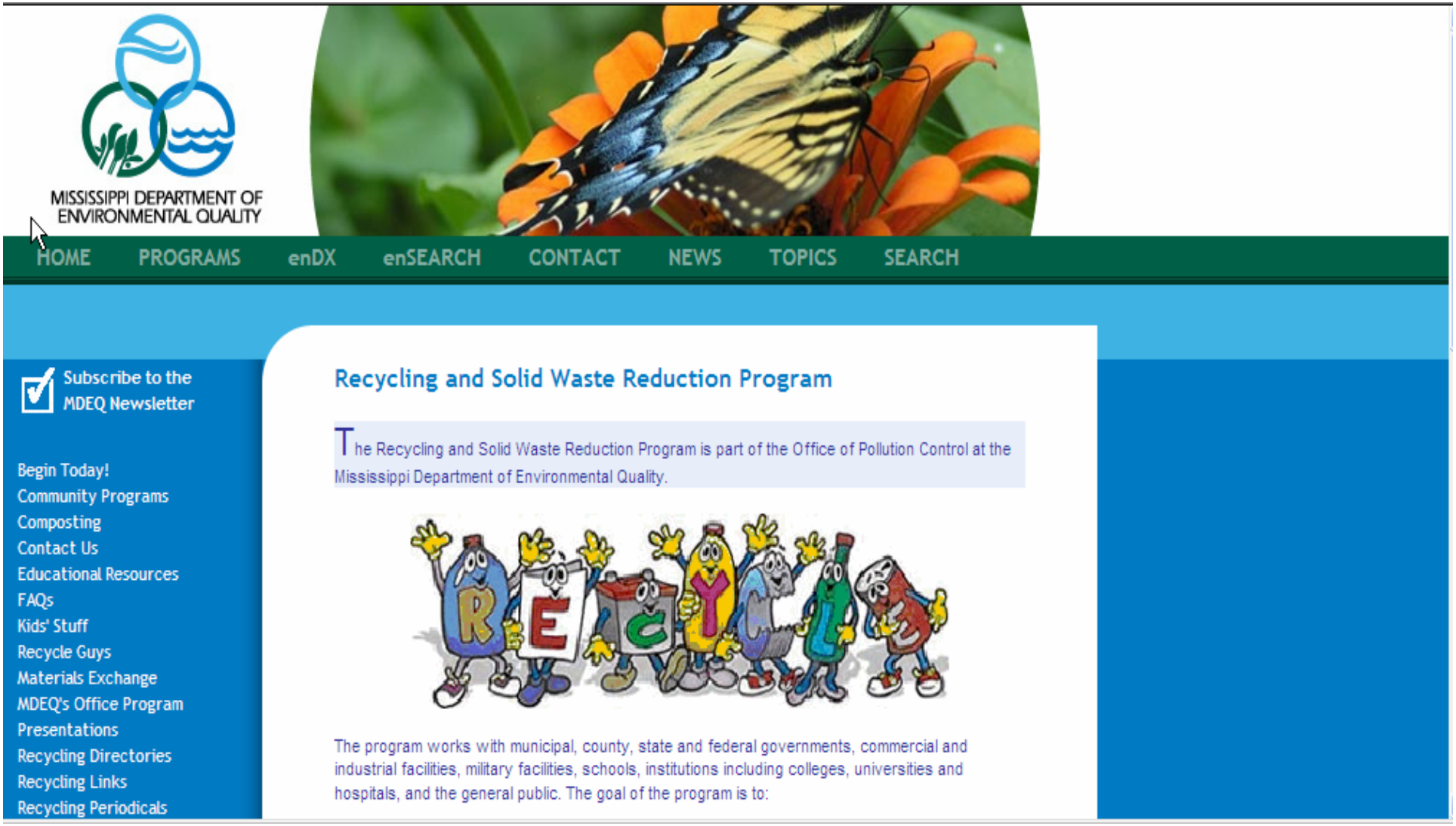
- EPP
- Water Conservation
- Green Cleaning

http://www.epa.gov/region09/waste/p2/hospart.html

MDEQ RECYCLING RESOURCES

http://www.deq.state.ms.us

Contact: John David Burns 601-961-5005



ADDITIONAL RESOURCES

Resources - Web

HEALTH CARE WITHOUT HARM

A global coalition of 473 organizations in more than 50 countries working to protect health by reducing pollution in the health care sector

www.noharm.org/us

Resources - Web

SUSTAINABLE HOSPITALS

The **Sustainable Hospitals Program** is part of **The Lowell Center for Sustainable Production** located within the University of Massachusetts.

http://www.sustainablehospitals.org

Resources - Web

Subscriber Service – Practice Greenhealth (formerly H2E)

http://www.practicegreenhealth.org

Resources - Web

GREEN GUIDE FOR HEALTH CARE

A best practices guide for healthy and sustainable building design, construction, and operations for the healthcare industry

www.gghc.org

Resources - Web

US GREEN BUILDING COUNCIL - LEED RESOURCES

www.usgbc.org/leed

Mississippi Chapter

FIRST FRIDAY EDUCATIONAL SERIES

http://chapters.usgbc.org/mississippi

Resources - MDEQ P2 Group

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Case Study: Christ Hospital Cincinnati, Ohio

550 beds

- Recycles 390 tons of waste annually
  - Net benefit of $75,000 in 2006
- Energy
  - Lighting audit resulted in $274,600 over 5 yrs
  - Chiller optimization program - total deferred cost of $191,000 per year

Act Now!!!

✓Increase recycling rates to 20% of total waste volume (or higher!).
✓Reduce RMW generation to less than 5 pounds per bed per day.
✓Transition to a reusable sharps container program, significantly reducing Regulated Medical Waste.
✓Recycle all fluorescent bulbs regardless of green tip status.
✓Investigate reprocessing services where appropriate, to drastically reduce waste generation and conserve resources.
Integrate green building approaches and materials into any renovation or new construction projects.
Implement a Green Cleaning program to improve indoor air quality and reduce worker and patient exposures.
Implement a food waste composting program.
✓Implement a best management practices approach to handling hazardous pharmaceutical waste.

WHERE DO I START?

HOW CAN I MANAGE EVERYTHING?

P2 & SUSTAINABILITY

Environmental Management Systems

A “best practices” approach for continual improvement

Detroit Medical Center

"Senior management saw the EMS approach as the most effective and efficient way to achieve management of the environmental processes"

- Sheila Finch, DMC

First Hospital in the US to achieve registration in the environmental system (IS014001)

WHY AN EMS?

- ✓Moves “beyond compliance”
- ✓Combines multiple environmental programs under one umbrella
- ✓Provides structured format for continual improvement

EMS Components

- **Policy**
- **Environmental Aspects and Impacts**
- **Training**
- **Communication**
- **Documentation/Document Control**
- **Operational Control**
- **Emergency Preparedness & Response**
- **Monitoring/Measurement**
- **Auditing**

TEAM APPROACH

Environmental Management System

An EMS challenges hospital employees to identify and prioritize environmental aspects, take steps to minimize adverse environmental impacts, and set targets to continually improve performance.

Sample Environmental Aspects & Impacts

Activity	Aspect	Impact
Preparing Antineoplastic/Cytotoxic Drugs	Biomedical Waste generation	Human health, Air Pollution (e.g. incineration), Waste (Hazardous)
	Air Emissions (requires fume hood)	Human health, Air Pollution (chemical vapors)
	Possible Occupation Exposure to Cytotoxic Material	Human health, Air Pollution (chemical vapors)

Resource

The Health Care Guide to Pollution Prevention Implementation though Environmental Management Systems

EPA/625/C-05/003

Example EMS procedures, forms, case studies, auditing tools

Environmental Management Systems & MDEQ

enHance
ENVISION HEIGHTENED AWARENESS
NURTURING CONSERVATION & ENVIRONMENTAL EXCELLENCE

MDEQ's Environmental Stewardship Initiative

MDEQ P2 Contacts (Again!)

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